

## 5. DEVELOPMENT STAGE

5.1. Overview. The Development stage converts the products of the System Design into a complete system and data base(s). Although much of the activity in the Development stage addresses the computer programs that make up the system, this stage also puts in place the hardware, software and communications environment for the system, and produces the manual procedures and other important elements of the overall system. Some of the most significant activities of this stage include:

- o Acquiring and installing the necessary hardware, data communications, systems software, and applications software packages (if any) that make up the system environment.
- o Developing program code.
- o Thoroughly documenting system procedures
- o Creating data base structures and loading test data into them.
- o Developing reference manuals and user support materials.
- o Testing the system, in individual components and combined.

The activities of the Development stage translate the System Design produced during the Design stage into a working system and data base(s), capable of solving the information management problem. All the elements of the system are developed (or acquired), tested, and integrated: hardware, system software, communications, applications, procedures, and associated documentation. At the end of Development, the system and data base(s) are ready for the activities of the Implementation stage which will make the system available to users.

Several points are of particular note for the Development stage:

- o Although the system is not complete at this stage, it is sufficiently developed to support the remaining activities that will implement the system in the next stage, such as user training and conversion of existing data.
- o Confirming that the system is ready for implementation, through careful testing, helps to minimize surprises during the implementation, and to keep implementation on schedule.

- o Any newly identified requirements, and/or suggested modifications to the System Design, must fully consider the impact on all elements of the system and on the organizations that will interact with the system.
- o For large systems, the Development stage can be very long and complex. Interim reviews during this stage will help to ensure that the development effort continues to address all requirements and follow the approved System Design. The number, content and timing of the interim reviews will vary for each system based on its scope, functionality, and complexity, and the methods and tools used to develop the system.
- o During the Development stage, much of the effort is conducted by the project team and quality assurance function. Other organizations participate less intensively than during prior phases and stages, but are actively involved in some selected activities.
- o The Development Baseline is established at the end of this stage. It consists of the developed system, User Manual, Operation Manual, Operation Manual, Security Manual, user support manuals, and Development Data Base(s).

5.2. Detailed Description. A detailed description of the Development stage is presented in the following exhibits:

Exhibit 5-1	Development Stage Summary
Exhibit 5-2	Development Stage Objectives
Exhibit 5-3	Development Stage Decisions
Exhibit 5-4	Development Stage Activities
Exhibit 5-5	Development Stage Roles and Responsibilities
Exhibit 5-6	Product: Development System
Exhibit 5-7	Product: Development Data Base(s)
Exhibit 5-8	Product: Maintenance Manual
Exhibit 5-9	Product: User Manual
Exhibit 5-10	Product: Operation Manual
Exhibit 5-11	Product: Security Manual
Exhibit 5-12	Product: User Support Materials
Exhibit 5-13	Product: Development Decision Paper
Exhibit 5-14	Product: Project Management Plan
Exhibit 5-15	Product: Data Management Plan
Exhibit 5-16	Product: System Test Document
Exhibit 5-17	Product: Acceptance Test Document

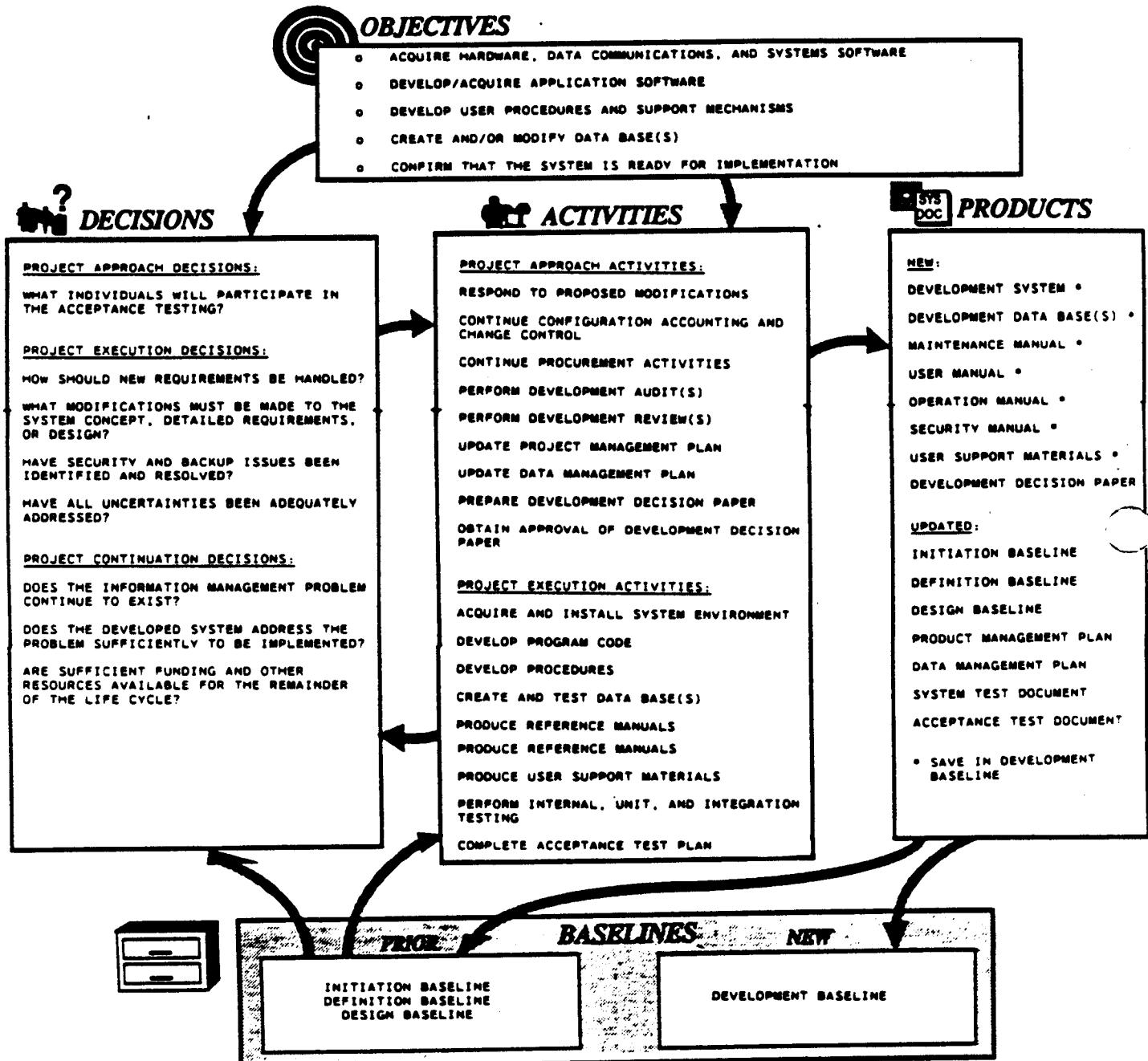
The following products may also be updated during the Development stage:

<u>Product</u>	<u>Exhibit</u>
<b>Initiation Baseline</b>	
Initiation Decision Paper	1-6
System Concept	2-6
<b>Definition Baseline</b>	
Configuration Accounting Records	3-6
Detailed Functional Requirements	3-7
Detailed Data Requirements	3-8
Requirements Data Dictionary	3-10
<b>Design Baseline</b>	
System Design	4-6
Physical Data Base Design	4-8
Design Data Dictionary	4-9

Outlines of all products are presented in Appendix B.

A number of activities of the Development stage relate to specific topics that are addressed functions that are performed throughout the life cycle. A life cycle wide view of these topics is presented in Chapter 10 of this Guidance.

## EXHIBIT S-1: DEVELOPMENT STAGE SUMMARY





## EXHIBIT 5-2: DEVELOPMENT STAGE OBJECTIVES

OBJECTIVE NAME	OBJECTIVE DESCRIPTION
Acquire hardware, data communications, and system software	Acquires resources not currently in place, if any, that are needed to conduct the development and implementation of the system. Procurements are awarded to successful bidders.
Develop/acquire application software	Creates the automated processing components of the system in the form of new or modified applications programs and/or commercial software package(s), with modifications, if needed.
Develop user procedures and support mechanisms	Creates the manual processing components of the system in the form of new or modified manual procedures. Creates both initial user training and ongoing user support materials, with consideration for the perspectives and degrees of readiness of the expected users.
Create and/or modify data base(s)	Creates the data base(s) designed in the Design stage, along with automated procedures to manage the data base(s). If necessary, modifies existing data base(s) that will be used to support the system.
Confirm that the system is ready for implementation	Confirms that the system works properly and is ready for acceptance testing by the user organization(s), and for other implementation activities.



## EXHIBIT 5-3: DEVELOPMENT STAGE DECISIONS

DECISION NAME	DECISION DESCRIPTION
	<u>Project Approach Decisions:</u>
What individuals will participate in the acceptance testing?	Selects specific individuals from the participating program activities to represent their organizations during acceptance testing. Confirms details of testing procedures and logistics.
	<u>Project Execution Decisions:</u>
How should new requirements be handled?	Determines whether new requirements which surface during Development should cause immediate modifications to the design and should be incorporated into ongoing life cycle efforts; or should be deferred to a later phase and treated as changes or minor enhancements; or if sufficiently large, should be managed via separate life cycle efforts.
What modifications must be made to the system concept, detailed requirements, or design?	If any new requirements or constraints have been identified during the Development stage, determines the modifications which must be made to the system concept, definition, or design to accommodate them. Determines whether the information management problem has changed.
Have security and backup issues been identified and resolved?	Determines whether the security approach presented in the Project Management Plan and Security Manual is adequate. Determines whether the backup procedures presented in the User and Operation Manuals are adequate.
Have all uncertainties been adequately addressed?	Determines whether all identified programmatic, organizational and technical issues related to the completion of the system have been addressed sufficiently to support the activities of the Implementation stage, and resolves issues as needed. Notes issues or constraints, and corresponding features of the system, which require special emphasis during implementation (e.g., special training emphases).



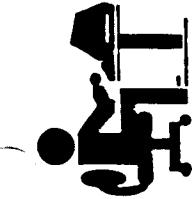
## EXHIBIT 5-3: DEVELOPMENT STAGE DECISIONS (Continued)

DECISION NAME	DECISION DESCRIPTION
<u>Project Continuation Decisions:</u>	
Does the information management problem continue to exist?	Confirms that the defined information management problem continues to exist, or that it has changed so significantly from the problem addressed by the system that a major redefinition of the system may be needed.
Does the developed system address the problem sufficiently to be implemented?	Confirms that the system adequately addresses the problem, and that appropriate approvals have been secured for the system to be implemented in its current form.
Are sufficient funding and other resources available for the remainder of the life cycle?	Confirms that the funding, personnel, and other resources needed to support the operation of the system through the life cycle are available.



## EXHIBIT 5-4: DEVELOPMENT STAGE ACTIVITIES

ACTIVITY NAME	ACTIVITY DESCRIPTION	PRODUCT CONTAINING RESULTS
<u>Project Approach Activities:</u>		
Respond to proposed modifications	Assess proposed modifications to the requirements, and/or to the design, to ensure that they solve the information management problem. Note potential impacts on all aspects of the system (including impacts on user organizations), and determine those modifications which should be made at the present time, those that should be deferred for a final decision until after the system is implemented, and those that should not be accomplished.	Configuration Accounting Records
Continue configuration accounting and change control	Denote configuration items with respect to all components of the system (e.g., data structures, application software, procedures, and system environment). Maintain records of suggested modifications to the system and their disposition, including notation of potential modifications to be addressed after the system is implemented and available to the users.	Configuration Accounting Records
Continue procurement activities	Continue those tasks needed to acquire needed resources (e.g., hardware, software, communications, services) to develop, implement, and operate the system.	Project Management Plan



## EXHIBIT 5-4: DEVELOPMENT STAGE ACTIVITIES (Continued)

ACTIVITY NAME	ACTIVITY DESCRIPTION	PRODUCT CONTAINING RESULTS
<u>Project Approach Activities (Continued):</u>		
Perform development audit(s)	Examine the developed system, all reference manuals, and the Project Management Plan to confirm that all required content has been provided. Compare these products with the configuration accounting records to ensure that all suggested modifications, and their current disposition, are clearly documented. Multiple audits may be necessary if major rework of these products takes place prior to final review and approval.	Development System Development Data Base(s) Design Data Dictionary Maintenance Manual User Manual Operation Manual Security Manual User Support Materials Project Management Plan Configuration Accounting Records
Perform development review(s)	Confirm that the information management problem continues to exist. Determine whether the functional or data requirements are changed. Note and confirm the recommendation of any significant modifications to the system concept, definition, or design. Confirm that the developed system appears to address the information management problem at reasonable cost, in a responsive timeframe, and at acceptable risk.	Development System Development Data Base(s) Design Data Dictionary Maintenance Manual User Manual Operation Manual Security Manual User Support Materials
Update Project Management Plan	Develop a detailed workplan for the Implementation stage, and refine workplans for subsequent phases and stages as needed. Update and refine the benefit-cost analysis and threshold analysis of reviews and approvals as needed.	Project Management Plan



## EXHIBIT 5-4: DEVELOPMENT STAGE ACTIVITIES (Continued)

ACTIVITY NAME	ACTIVITY DESCRIPTION	PRODUCT CONTAINING RESULTS
<u>Project Approach Activities (Continued):</u>		
Update Data Management Plan	Refine Data Management Plan as needed to address issues raised during the Development stage.	Data Management Plan
Prepare Development Decision Paper	Summarize the results of all other project approach and execution activities conducted in the Development stage. Include results of threshold analysis to confirm levels of review and approval.	Development Decision Paper
Obtain approval of Development Decision Paper	Obtain program management approval to continue with the Implementation stage, and confirm the continued commitment and availability of funding and other resources for the remainder of the system life cycle.	Development Decision Paper
<u>Project Execution Activities:</u>		
Acquire and install system environment	Acquire and install the hardware, systems software, and communications capabilities needed to develop and/or implement the system.	Operation Manual



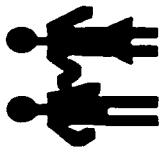
## EXHIBIT 5-4: DEVELOPMENT STAGE ACTIVITIES (Continued)

ACTIVITY NAME	ACTIVITY DESCRIPTION	PRODUCT CONTAINING RESULTS
<u>Project Execution Activities (Continued):</u>		
Develop program code	Produce the software that corresponds to the design of the system (the applications software). Convert any existing software identified in the System Design. For systems that make use of an existing software package, produce the modifications to the package specified in the design. This activity may need to be coordinated with system development or modification activities for other systems with which this system will have an automated interface.	Development System Maintenance Manual
Develop procedures	Prepare detailed descriptions of all procedures needed to operate and support the system. For procedures to be converted from existing systems, document the necessary modifications. These include tasks or actions conducted by typical users, as well as tasks/actions conducted by the system administrator.	User Manual Operation Manual Security Manual
Create and test data base(s)	Produce the structural changes or additions required to existing data bases in accordance with the system design. Construct any new data base(s) needed. Test each data base.	Development Data Base(s) Physical Data Base Design Design Data Dictionary
Produce reference manuals	Refine materials produced in other activities to generate complete documentation of the system for all individuals who will use or support the system.	Maintenance Manual User Manual Operation Manual Security Manual



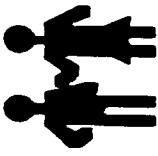
## EXHIBIT 5-4: DEVELOPMENT STAGE ACTIVITIES (Continued)

ACTIVITY NAME	ACTIVITY DESCRIPTION	PRODUCT CONTAINING RESULTS
<u>Project Execution Activities (Continued):</u>		
Produce user support materials	Produce the materials to be used in the initial education of users, operators, and other support individuals about the system; and materials to be used for ongoing training and user support during the Production stage.	User Support Materials
Perform internal, unit, and integration testing	<p><u>Internal testing:</u> While each system component is being developed, check it continually to assure that it is internally consistent and conforms to specifications. <u>Unit testing:</u> As each system component is completed, test it to ensure that it operates correctly. Test any new physical data base design to ensure that it adequately supports the system. <u>Integration testing:</u> After all system components are complete, assemble them in the development environment and test to verify that the system operates correctly in its entirety and satisfies the functional and data requirements.</p>	Development System Development Data Base(s) System Test Document
Complete acceptance test plan	Expand existing acceptance test plan to provide all needed test data, and confirm details of testing procedures and logistics (e.g., setup of acceptance test environment, selection of specific individuals to conduct testing, travel arrangements for test team).	Acceptance Test Document



## EXHIBIT 5-5: DEVELOPMENT STAGE ROLES AND RESPONSIBILITIES

ACTIVITIES	ROLES AND RESPONSIBILITIES					
	OWNER MANAGEMENT	PROGRAM STAFF	OWNER PROGRAM STAFF	PROJECT MANAGEMENT	PROJECT STAFF	QUALITY ASSURANCE
RESPOND TO PROPOSED MODIFICATIONS	APPROVE	SUPPORT	LEAD	PERFORM	REVIEW	PROCUREMENT
CONTINUE CONFIGURATION ACCOUNTING AND CHANGE CONTROL			LEAD	PERFORM	REVIEW	SUPPORT
CONTINUE PROCUREMENT ACTIVITIES		SUPPORT	LEAD	PERFORM	REVIEW	
PERFORM DEVELOPMENT AUDIT(S)		PERFORM	LEAD	PERFORM	REVIEW	SUPPORT
PERFORM DEVELOPMENT REVIEW(S)		SUPPORT	LEAD / PERFORM	SUPPORT	REVIEW	PERFORM
UPDATE PROJECT MANAGEMENT PLAN		SUPPORT	LEAD / PERFORM	SUPPORT	REVIEW	
UPDATE DATA MANAGEMENT PLAN		SUPPORT	LEAD / PERFORM	SUPPORT	REVIEW	
PREPARE DEVELOPMENT DECISION PAPER		SUPPORT	LEAD / PERFORM	SUPPORT	REVIEW	
OBTAIN APPROVAL OF DEVELOPMENT DECISION PAPER	APPROVE	SUPPORT	LEAD / PERFORM	SUPPORT	REVIEW	



## EXHIBIT 5-5: DEVELOPMENT STAGE ROLES AND RESPONSIBILITIES (Continued)

ROLES AND RESPONSIBILITIES (Continued)					
ACTIVITIES	OWNER MANAGEMENT	PROGRAM STAFF	PROJECT MANAGEMENT	PROJECT STAFF	QUALITY ASSURANCE
			LEAD	PERFORM	REVIEW
ACQUIRE AND INSTALL SYSTEM ENVIRONMENT					
DEVELOP PROGRAM CODE	SUPPORT		LEAD	PERFORM	REVIEW
DEVELOP PROCEDURES	SUPPORT		LEAD	PERFORM	REVIEW
CREATE AND TEST DATA BASE(S)	SUPPORT		LEAD	PERFORM	REVIEW
PRODUCE REFERENCE MANUALS	SUPPORT		LEAD	PERFORM	REVIEW
PRODUCE USER SUPPORT MATERIALS	SUPPORT		LEAD	PERFORM	REVIEW
PERFORM INTERNAL, UNIT, AND SYSTEM TESTING	PERFORM		LEAD	PERFORM	REVIEW
COMPLETE ACCEPTANCE TEST PLAN	SUPPORT		LEAD	PERFORM	REVIEW



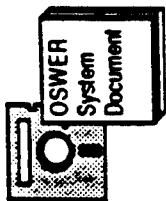
## EXHIBIT 5-6: DEVELOPMENT SYSTEM

### SUMMARY DESCRIPTION

The Development System consists of physical hardware, system software, communications, application software, and manual procedures. All system components, particularly current copies of all custom software source code, should be in the possession of EPA (including software developed by contractors). Descriptions of these components of the system are contained in other products of the system life cycle as follows:

#### System Component

<u>System Component</u>	<u>Life Cycle Product Describing Component</u>
Hardware, system software, communications, application software	Design Document Maintenance Manual
Manual procedures for users	User Manual
System operation and support procedures	Operation Manual



## EXHIBIT 5-7: DEVELOPMENT DATA BASE(S)

### SUMMARY DESCRIPTION

The Development Data Base(s) consist(s) of physical data structures and the actual contents of the system data base(s) prior to implementation of the system. The contents include any data converted from existing automated systems and manual procedures, and other data needed to support system development and testing. The design of the data base(s) and a description of contents are contained in other products of the system life cycle, as follows:

#### System Components Described

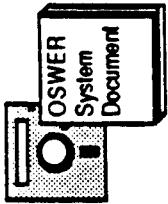
Data base design in the context of the overall system architecture

Logical and physical data base design, including metadata

#### Life Cycle Product Describing Component

Design Document

Production Data Dictionary

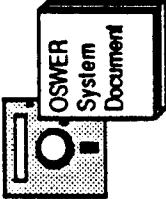


# EXHIBIT 5-8: MAINTENANCE MANUAL

## SUMMARY DESCRIPTION

The System Maintenance Manual is produced during the Development stage to provide reference information needed to modify the applications software in order to correct errors, develop and implement enhancements to the system, and respond to changes in the system environment, such as a hardware or system software upgrade. This manual draws upon several other products of the system life cycle (in particular the System Design documents, Design Data Dictionary, and configuration accounting records), and may be cross-referenced to them in order to minimize redundancy.

- | TOPICS  |  |
|---|--|
| o Introduction  | -- Location of source code   |
| -- Purpose of this document   | o Maintenance policy/procedures  |
| -- References to related documents  | o Change control procedures  |
| o System overview   | -- Procedures for identifying modifications to be made, for monitoring modifications, and for controlling the implementation of modifications should be documented in the Configuration Management Plan for the system, and referenced in the Maintenance Manual |
| o System environment  | o Record of modifications  |
| -- Hardware   | -- Individual modifications to the system should be identified in the configuration accounting records for the system, and reflected in updates to affected system documentation.  |
| -- System software  |  |
| -- Communications   |  |
| -- Applications software languages/tools (e.g., fourth generation language, programming language, data base management system, report writers/retrieval software, etc.) |  |
| -- Standards  |  |
| o Program descriptions  |  |
| -- Program identification, relationships  |  |
| -- Program description  |  |



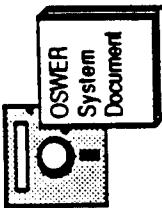
## EXHIBIT 5-9: USER MANUAL

### SUMMARY DESCRIPTION

The User Manual is produced during the Development stage to provide instructions and reference materials describing how the user interacts with the system. The level of detail of the User Manual should reflect the complexity of the system, the extent of on-line assistance available to the user, and the relative sophistication of most users. For some systems, two versions of the User Manual may be appropriate: one for the typical user, and another for the system administrator. The User Manual draws upon previously developed design documentation describing pertinent programmatic or administrative operating procedures that define the framework for using the system. For systems that are integral to program operation, the User Manual may frequently reference such documentation; alternatively, it may integrate the content of these documents with the typical system-specific content of a User Manual to produce a single document.

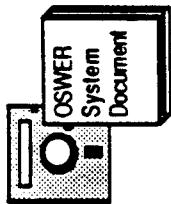
### TOPICS

- o Introduction
  - Purpose of this document
  - References to related documents (must include a reference to the Design Data Dictionary, and may contain an extract from the Design Data Dictionary as an appendix.)
- o System overview
  - Structure of the system, in terms of major modules and processing, presented from a user perspective
- o System use information
  - Standards and conventions
  - Help/user assistance
  - System access
  - System navigation (e.g., summary of command structure, menus, etc.)
  - Exiting the system



## EXHIBIT 5-9: USER MANUAL (Continued)

- o User functions
  - Backup and recovery
  - Table maintenance
  - Data archiving (e.g., end-of-year processing)
  - Special data base routines
  - [Other system administration functions, as applicable]
- o Appendices/supporting materials
  - Record of modifications to user manual
  - [Data dictionary extract]
  - Input documents/forms
  - Glossary
- o System administration functions
  - Security



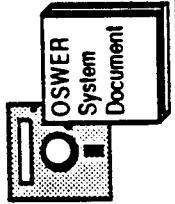
# EXHIBIT 5-10: OPERATION MANUAL

## SUMMARY DESCRIPTION

The Operation Manual is produced during the Development stage to provide instructions and reference materials describing the tasks conducted by computer facility support personnel to enable the system to operate properly. Individual processing jobs and procedures are described in this manual. The contents of this manual are generally applicable to systems which operate on facilities that are managed and controlled by individuals other than the system users. This manual draws upon several other products of the system life cycle (in particular the System Design documents and configuration accounting records), and may be cross-referenced to them in order to minimize redundancy. For systems in which the users or the system manager perform all of the tasks identified in this manual without the assistance of facilities support personnel, the content of this manual may be included in the User Manual.

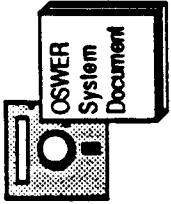
## TOPICS

- Introduction
  - Purpose of this document
  - References to related documents
- System overview
  - Hardware, software, and communications architecture, including designation of current releases for non-shared resources (e.g., dedicated workstations)
- System contacts
  - System manager
- Other routine procedures
  - Other contacts
  - Central operation -- description of procedures for:
    - System initialization
    - Data base update
    - Reports
    - Data archiving
    - System shutdown
    - Backup
    - System restart/recovery
    - Security
    - Other routine procedures



## EXHIBIT 5-10: OPERATION MANUAL (Continued)

- o Remote operation (for systems using distributed processing capabilities) --  
description of procedures for:
  - System initialization
  - Data base update
  - Reports
  - Data archiving
- o System shutdown
  - Backup
  - System restart/recovery
  - Security
  - Other routine procedures
  - Nonroutine procedures
- o Error messages



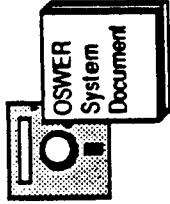
## EXHIBIT 5-11: SECURITY MANUAL

### SUMMARY DESCRIPTION

The Security Manual is prepared during the Development stage to describe special system security features, and related user procedures, for those systems which process either confidential or highly sensitive data. This manual is intended for use by all individuals who may interact with the system, either as users of the system (including users of the outputs with no hands-on interaction), as system manager, or as facilities support staff. This manual generally is not required for other systems for which limited access to data is not an exceptionally important concern. The Security Manual draws from and expands on the security approach presented in the Project Management Plan.

### TOPICS

- Introduction
  - Purpose of this document
  - References to related documents
  - Summary of requirements for security
- Security organization
  - Security organization structure and staffing
  - Incident reporting
- Levels of security
  - System users
  - System support staff
  - Facilities operation staff
  - Contractors and other non-EPA staff
- Procedures for secure handling of controlled documents
  - Identification of pertinent inputs/outputs
  - Labelling requirements
  - Control logs and related procedures
- Restrictions on access to automated data (data base access and retrieval)
  - Hardware, system software, and communications security
- Reporting of security incidents
  - Types of incidents
  - Reporting procedures



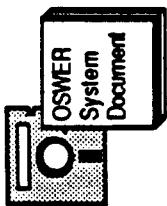
## EXHIBIT 5-12: USER SUPPORT MATERIALS

### SUMMARY DESCRIPTION

User support materials are the presentation aids, documents, and other materials that support the education of users and system support personnel, along with the materials and procedures which enable the system support personnel to provide user support during the production stage. User support materials may include other products generated during development, such as the User Manual and Operation Manual. User support materials may take the form of automated system demonstrations, tutorials, and help programs as well as hardcopy documents.

### TOPICS

- o For managers:
  - Programmatic purpose of the system
  - Major data entities and sources
  - Reports and inquiries
  - Contacts for support and assistance
- o For operators:
  - Other user procedures
  - System administration
  - Contacts for support and assistance
- o For users:
  - System architecture overview
  - Program descriptions
  - Operating environment
  - Maintenance procedures
  - Description of runs
  - Nonroutine procedures
  - Remote operation
  - Contacts for support and assistance



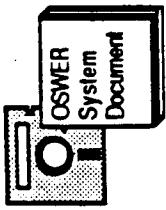
## EXHIBIT 5-13: DEVELOPMENT DECISION PAPER

### SUMMARY DESCRIPTION

The Development Decision Paper serves as a decision document for presentation to OSWER program management. It demonstrates that the system as currently developed provides an acceptable solution to the information management problem. The Development Decision Paper provides a summary of the key activities of the Development stage, emphasizing those aspects of the system that are important to program management. It requests two major actions: confirmation of support and resources for the remainder of the life cycle, and approval to continue with the Implementation stage.

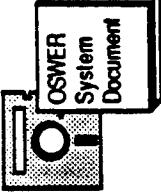
### TOPICS

- o Introduction
  - Purpose of this Development Decision Paper
  - References to related documents
- o Requirements
  - Confirm Initiation Decision Paper still valid
  - New functional requirements (if any)
  - New data requirements (if any)
- o Update of threshold analysis of reviews and approvals
  - o Summary of developed system
    - Key elements
    - Differences from System Concept, Detailed Requirements, or Design
    - Risks or issues for which decisions have been deferred
  - o Results of Development review (note any incomplete reviews)
    - Summary of findings
    - Recommendations



## EXHIBIT 5-13: DEVELOPMENT DECISION PAPER (Continued)

- o Issues
  - Actions on prior issues
  - New or outstanding issues
- o Summary of workplan and next steps
  - Summary of decisions needed
  - Request confirmation of associated resources/funding
    - Request approval to continue with Implementation stage



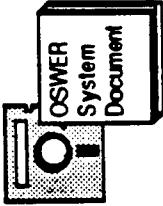
# EXHIBIT 5-14: PROJECT MANAGEMENT PLAN

## SUMMARY DESCRIPTION

The Project Management Plan is refined throughout the Development stage to fine tune the project team's management approach. The Project Management Plan is largely complete by the end of the Design stage, and typically only minor changes are made during Development. Some topics (e.g., security approach, maintenance approach) are summarized in the Project Management Plan and presented in greater detail in other life cycle products. Underlined items are added to the Project Management Plan for the first time during this stage; other material was initially developed during earlier stages, and is refined as appropriate during Development).

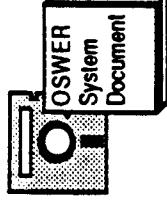
## TOPICS

- o Project charter/objectives
  - Project identification (incorporate Initiation Decision Paper by reference)
  - Mission and objectives
  - Scope of information management problem/project
  - Project management structure
    - Manager assigned: individual, current organization, authority Boards, committees, or other project management participants
    - Project team organization
      - Structure and roles
      - Participating organizations
      - Staffing Plan (including internal staff and use of contractors)
    - Other organizations to be notified of major project events (non-participants in project team)
- o Life cycle adjustment
- o Consolidation of phases and stages, if any
- o Partitioning of project/system into major work packages, modules, etc. with different timing through the life cycle
- o Project team organization



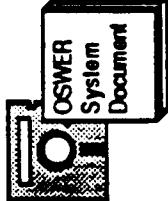
## EXHIBIT 5-14: PROJECT MANAGEMENT PLAN (Continued)

- o Project budget (broken out by stage)
  - Methodology and assumptions
  - Benefits
    - Programmatic
    - Annual monetary
    - System life
  - Costs
    - Nonrecurring
    - Recurring
    - Annual
    - System life
- o Project reviews/quality assurance
  - Applicable project review level
  - Reviews to be conducted (by stage)
  - Organization/individuals for each review
  - Review schedule
  - Applicable project approvals
    - Project approval level
    - Specific approvals to be obtained (by stage)
    - Approval organization and individuals
    - Approval schedule
    - Benefit-cost analysis (summary, transferred from other life cycle products)
- o Methodologies and tools
  - Payback period
  - Sensitivity analysis
  - Methodologies (non-automated)
    - For Concept phase
    - For Definition stage
    - For Design stage
    - For Development stage
    - For Implementation stage
    - For Production stage
    - For Evaluation stage
    - Impact on Archive stage



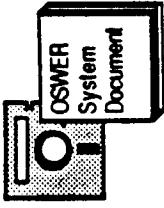
## EXHIBIT 5-14: PROJECT MANAGEMENT PLAN (Continued)

- Automated tools/software packages
  - For Concept phase
  - For Definition stage
  - For Development stage
  - For Implementation stage
  - For Production stage
  - For Evaluation stage
  - Impact on Archive stage
  - Support required (if any) for use of tools
- o Workplan
  - Concept phase
  - Definition stage
  - Design stage
  - Development stage
  - Implementation stage
  - Activities and related tasks
    - Products
    - Schedule by task and product
    - Staff and contractor assignments
    - Level of resources for each task and/or product
    - Task relationships/dependencies
    - Schedule of reviews and approval
    - Performance/progress reporting
    - Notification
    - Production stage (see Implementation above for contents)
    - Evaluation stage (see Implementation above for contents)
  - o Procurement approach



## EXHIBIT 5-14: PROJECT MANAGEMENT PLAN (Continued)

- o Documentation standards: Standards to be used for each life cycle product
  - Error conditions to be corrected
- o Security approach
  - Summary of security requirements
    - (reference other life cycle products)
    - Security organization (if applicable)
    - Hardware and facilities measures
    - Software and communications measures
    - Data base security
    - Procedural measures
    - Backup and recovery
  - Training activities
- o Conversion approach
  - Overview
    - Data identification
    - Current data location
    - Organizations to accomplish conversion
  - Maintenance approach
    - Ongoing user support (hotline, etc.)
- o Sources
  - Procedures
  - Error conditions to be corrected
- o Automated data to be converted
  - Sources
  - Procedures
- o Installation approach: Schedule for installing each separately-installed system module
  - Dates and times, by module and location
  - Special conditions
  - Personnel to accomplish installation, and/or on call
- o User support approach
  - Materials to be prepared
    - Sessions, schedules, and participants
  - Reference to Maintenance Manual
- o Operation approach
  - Organization of operation support activities
  - Reference to Operation Manual



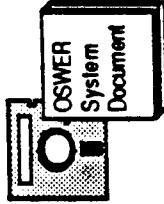
# EXHIBIT 5-15: DATA MANAGEMENT PLAN

## SUMMARY DESCRIPTION

The Data Management Plan reflects the project's data management approach. As the project progresses through the life cycle, additional information is added to this plan, and existing information is modified to reflect the current approach. Some topics (e.g., entity definitions, logical data model) are summarized in the Data Management Plan, and presented in greater detail in other life cycle products. Underlined items are added to the Data Management Plan for the first time during this stage; other material was initially developed during earlier stages, and is refined as appropriate during Development.

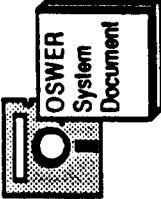
## TOPICS

- o Information need
  - Document the information need
  - Missions supported
  - Scope of the need
- o Data steward organizations
  - Lead organization responsibilities
  - Other organizations' roles
  - Data definers for the project
- o Concept phase
  - Entity list
  - Entity definitions
  - Entity identifiers
  - Conceptual data model
  - Likely sources of data
  - Information flow/data model validation
- o Definition stage
  - Data distribution plan
  - Information collection burden
- o Design stage
  - Interview Plans
  - Data analysis by process
  - Entity normalization
  - Conceptual data model revision
  - High-level data requirements revision
  - Logical data model
  - Requirements Data Dictionary
  - Data flow/logical model validation



## EXHIBIT 5-15: DATA MANAGEMENT PLAN (Continued)

- o Development stage
  - Data structures for programming support
  - Data (structure) revision approach
  - Data backup, logging, and recovery plans
- o Implementation stage
  - Testing support (see Testing Support Plan)
    - Cutover plans
  - o Data documentation responsibilities
    - Creating data documentation
    - Maintaining existing data documentation
  - o Data quality assurance plan
    - Responsible organization
    - Milestones and staffing
    - Data quality objective monitoring plan
  - o Data security requirements and strategy
    - Sensitive data
- o Data life cycle methodologies and tools
  - Metadata management approach
    - Development & Installation phase
    - Data management software
    - Operation phase
  - o Data conversion strategy
    - Data conversion plan
  - o Sources
    - Media
  - o Plan for physical flow of data
    - Load programs required
    - Schedule and staffing
    - Validation
  - o Data testing strategy
    - Testing support
  - o Kinds of test data bases required
    - Test data provision
    - Performance validation plan
    - Responsible organization
    - Projected testing support needed

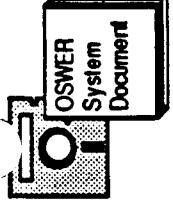


# EXHIBIT 5-16: SYSTEM TEST DOCUMENT

## SUMMARY DESCRIPTION

The System Test Document is updated during the Development stage by the addition of results, findings, and recommendations for the internal, unit, and system tests. This information is provided in summary form. The details of the testing conducted and results are reflected in the project team work papers and need not be included in the System Test Document. Underlined items are added to the System Test Document for the first time during this stage; other material was initially developed during earlier phases and is refined as appropriate during Development.

- | TOPICS                           |  |
|----------------------------------|--|
| ○ Introduction                   | -- Procedures<br>-- Test data description<br>-- <u>Test results</u><br>-- <u>Findings and analysis</u><br>-- <u>Recommendations</u>                          |
| ○ Purpose of this document       |  |
| ○ Reference to related documents |  |
| ○ Testing strategy               | ○ Integration testing<br>-- Procedures<br>-- Test data description<br>-- <u>Test results</u><br>-- <u>Findings and analysis</u><br>-- <u>Recommendations</u> |
| ○ Test plan                      |  |
| ○ Test criteria                  |  |
| ○ Internal testing               |  |
| ○ Procedures                     | ○ System testing<br>-- Test data description<br>-- <u>Test results</u><br>-- <u>Findings and analysis</u><br>-- <u>Recommendations</u>                       |
| ○ Unit testing                   |  |



## EXHIBIT 5-17: ACCEPTANCE TEST DOCUMENT

### SUMMARY DESCRIPTION

The Acceptance Test Document is updated during the Development stage by the addition of specific test data, and by the refinement of the Test Plan to identify the individuals who will participate in the testing and to address the details of the facility to be used to conduct the test. Underlined items are added to the Acceptance Test Document for the first time during this stage; other material was initially developed during Concept, Definition, or Design, and is refined as appropriate during Development.

### TOPICS

- o Introduction
  - Purpose of this document
  - References to related documents
- o Testing strategy
  - Participating organizations and individuals
  - Relationship of testing to other systems
  - Testing schedule
  - Test location(s) and facilities
  - Issues to be resolved
- o Test requirements/scenarios: description of representative events or cases that should serve as the basis for testing the system against the detailed Functional and Data requirements.
- o Test plan (addresses the following for each scenario)
  - Test procedure
  - Test data descriptions (description of test data and its source(s))
  - Test data (may be included in an appendix if the test data is particularly voluminous)